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BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

Int'l. Appln. No.: PCT/CA00/00981

Inventors: (1) Riccardo Brun del Re
(2) Izmail Batkin
(3) Wayne Young

Issued: 2 September 2004 (Filed August 25, 2000)

Patent No: 6,807,438 B1 (Serial No: 10/049,675)

Priority: Canadian Pat. Appln. 2,280,966 filed Aug.
26/99 and United States Pat. Appln.
09/505,732 filed Feb.17/00

Title: ELECTRIC FIELD SENSOR

Confirm. No. 7724

Our File: CORDL-02.PCT/US

Certificate

NOV 30 2004

of Correction

November 9, 2004

Attention: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

REQUEST FOR EXPEDITED ISSUANCE OF A CERTIFICATE OF CORRECTION

- 35 USC 154 -

- 37 C.F.R. 1.322 -

We enclose a form PTO/SB/44 completed as required by the patentee and request that a Certificate of Correction be issued under 37 CFR 1.322 (Office Mistake).

We enclose a copy of a Response with Amendments filed February 9, 2004 together with a copy of the Certificate of Facsimile Transmission of the same date. This Response includes as Schedule A a request for an amendment corresponding to the enclosed Certificate of Correction.

By an Office Action dated February 25, 2004 (copy enclosed) the Examiner advised that this Response was not fully responsive in respect of the claims and abstract. This objection was addressed in the applicant's Response faxed to the Office on

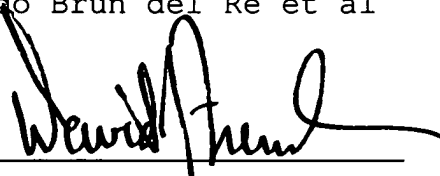
DEC 03 2004

March 29, 2004 (copy enclosed). A Notice of Allowability (copy enclosed) with an Examiner's Amendment was issued on June 2, 2004. Claim 2 as Allowed specifically references the feature for which a Certificate of Correction is being sought. In this exchange, the office failed to enter or to print the amendment as requested.

Respectfully submitted,

Riccardo Brun del Re et al

Per



David J. French

Reg. No. 31,229

P.O. Box 2486, Stn. D
Ottawa, Canada K1P 5W6
Telephone: (613) 567-6824 x 232 x231
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DEC 03 2004

**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**PATENT NO. : 6,807,438 **B1**

DATED : October 19, 2004

INVENTOR(S) : Riccardo Brun Del Re; Izmail Batkin; Wayne Young

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 8, line 17, after the words "FIG. 1B," insert --an unmodulated output,--

MAILING ADDRESS OF SENDER:

David J. French
P.O. Box 2486, Stn. D
Ottawa, Canada K1P 5W6

PATENT NO. 6,807,438 **B1**

No. of additional copies



This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: **Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DEC 03 2004

BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

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(2) Izmail Batkin
(3) Wayne Young

Filed: August 25, 2000

Serial No: 0/049,675

Priority: Canadian Pat. Appln. 2,280,966 filed Aug. 26/99
and United States Pat. Appln. 09/505,732 filed
Feb.17/00

Title: ELECTRIC FIELD SENSOR

Confirm. No.: 7724

Our File: CORDL-02.PCT/US

February 9, 2004
By Fax 1-703-872-9306 Only

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

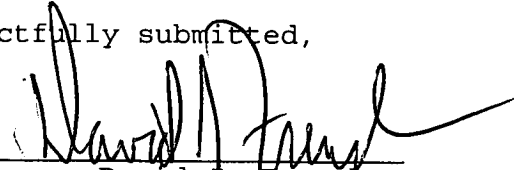
Certificate of Facsimile Transmission

I, the undersigned Registered Patent Attorney, hereby certify that the following documents are being delivered herewith by telephone facsimile to the United States Patent and Trademark Office on the above date:

1. Response to the Office Action of September 8, 2003
(2 pages) with Schedule A (1 pages) and Schedule B
(6 pages) attached
2. Request for a two month extension of time with request
for fees to be deducted from our Deposit Account
3. Information Disclosure with two articles attached (total
pages).

Respectfully submitted,

Per


David J. French
Reg. No. 31,229



such documents have been transmitted in accordance with the
particulars on the attached telefax confirmation sheet.

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DEC 03 2004

*** CONFIRMATION REPORT ***

SUCCESSFUL TX



02-09-04 21:27

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JOB NUM. ----- 912
 START TIME ----- 21:22
 ID NUM. ----- 31010*40#17038729306
 RESOLUTION ----- STANDARD
 TOTAL PAGES ----- 20
 MACHINE ENGAGED ----- 05'29
 INFORMATION ----- OK

BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

Int'l. Appln. No.: PCT/CA00/00981
 Inventors: (1) Riccardo Brun del Re
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Respectfully submitted,

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 Reg. No. 31,229

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

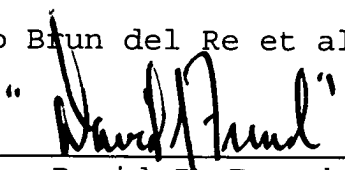
PETITION FOR EXTENSION OF TIME
- 37 C.F.R. 1,136(a) -

The applicant hereby formally requests, pursuant to CFR Title 37, Section 1.136, an extension of time of two months beyond the period set by the Examiner's Office Action to permit the filing of this response. Please deduct the requisite fee of \$210 (for a small entity) from our Deposit Account 501669.

Respectfully submitted,

Riccardo Brun del Re et al

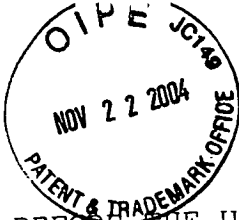
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David J. French
Reg. No. 31,229

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February 9, 2004
By Fax 1-703-872-9306 Only

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This letter is in response to the office Action of September 8, 2003. A Petition for a two month extension of time within which to respond accompanies this letter.

Amendments

In the Disclosure

The disclosure has been amended at page 16. Schedule A attached shows the amendments being made to the disclosure.

In the Claims

Attached as Schedule B are the claims showing the amendments being made to claims 22, 33 and 34.

Discussion

The Examiner has objected that the words "no greater than 50%" in claim 22 differs from "less than 50%". Claim 22 has been amended to reflect the words "less than 50%".

The Examiner has objected that the limitation in Claim 23 to "an unmodulated voltage signal" was not originally disclosed. Clearly, the disclosure addresses an "unmodulated voltage signal" as that is what is inherent in the circuits of Figures 1-4 and the associated disclosure. The disclosure states (page 15, lines 24-28):

"an electrical sensor system incorporating a pick-up electrode 1 ... placed adjacent a first location 2 on a body 3 where an electrical signal is to be sensed ..."

Thus a heart signal is picked-up. Then it is passed to a voltage divider network.

Out of an abundance of caution, the disclosure has been amended in the paragraph on page 16 from lines 10 to 19 to add at line 1, after "Figure 1B", the words --an unmodulated output,--. It is inherent that a voltage divider network provides an unmodulated output.

In respect of Claim 33, this claim has been deleted.

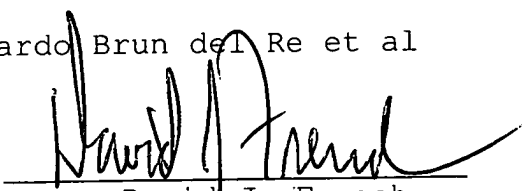
The applicant attaches an article and several US patent references which the Examiner may wish to review. These references are addressed in an IDS accompanying this Response.

On this basis, reconsideration and a favourable ruling is requested.

Respectfully submitted,

Riccardo Brun del Re et al

Per


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Reg. No. 31,229

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Page 1 of 1

Schedule A
Amendments to the Disclosure
in the Response dated February 9, 2004 in Serial No. 10/049,675

The output V_o from the voltage divider network which drives the operational amplifier IC1A, shown in Figure 1B, an unmodulated output, is measured across input resistor R_i that extends between the input of the operational amplifier IC1A through circuit ground to a reference capacitor C_R that is coupled to the body 3 at a second, separate location 5. This location 5 may be separated from the first location 2 in obtaining conventional ECG signals. The locations 2,5 may also be proximate, e.g. adjacent, at certain body locations and still provide useful signals.

02/25/04

Application/Control Number: 10/049,675

Page 2

Art Unit: 3739

Response to Amendment

The reply filed on February 9, 2004 is not fully responsive to the prior Office Action because of the following omission(s) or matter(s): the dependent claims depend upon cancelled claims, claims 39-41 were omitted, and applicant failed to submit an abstract. See 37 CFR 1.111. Since the above-mentioned reply appears to be *bona fide*, applicant is given **ONE (1) MONTH or THIRTY (30) DAYS** from the mailing date of this notice, whichever is longer, within which to supply the omission or correction in order to avoid abandonment.

EXTENSIONS OF THIS TIME PERIOD MAY BE GRANTED UNDER 37 CFR 1.136(a).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee S. Cohen whose telephone number is 703-308-2998. The examiner can normally be reached on Monday-Friday, 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Linda Dvorak can be reached on 703-308-0994. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 3739

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lee S. Cohen
Primary Examiner
Art Unit 3739

LSC
February 23, 2004

BEFORE THE UNITED STATES PATENT AND TRADEMARK OFFICE

Int'l. Appln. No.: PCT/CA00/00981

Inventors: (1) Riccardo Brun del Re
(2) Izmail Batkin
(3) Wayne Young

Filed: August 25, 2000

Serial No: 10/049,675

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Feb.17/00

Title: ELECTRIC FIELD SENSOR

Confirm. No. 7724

Our File: CORDL-02.PCT/US

FAXED
March 29, 2004

By Fax 1-703-872-9306 Only

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

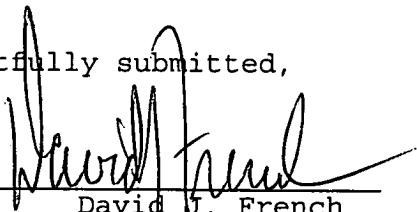
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(2 pages) with Schedule A (1 page) and Schedule B
(6 pages) attached
2. Request for a one month extension of time with request
for fees to be deducted from our Deposit Account

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Per


David G. French
Reg. No. 31,229

 such documents have been transmitted in accordance with the particulars on the attached telefax confirmation sheet.

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*** CONFIRMATION REPORT ***

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March 29, 2004
 By Fax 1-703-872-9306 Only

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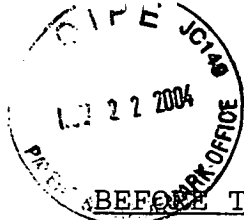
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FAXED
March 29, 2004

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P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This letter is in response to the Office Action of February 25, 2004. A Petition for a one month extension of time within which to respond accompanies this letter.

Amendments

In the Abstract

Please accept as an Abstract, the Abstract set-out as Schedule A hereto.

In the Claims

Please accept as Schedule B a complete listing of claims 1 to 41 showing amendments as requested for entry in the Response

filed February 9, 2004, but wherein:

Claims 23 to 28; 30-32 and 34-35 refer back to Claim 22 rather than Claim 1;

Claim 29 refers to Claim 28;

Claims 36-37 refer to Claim 35; and

Claims 39 to 41 refer to Claim 38.

On this basis, reconsideration and a favourable ruling is requested.

Respectfully submitted,

Riccardo Brun del Re et al

Per



David J. French
Reg. No. 31,229

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Telefax: (613) 567-4689



Schedule A
New Abstract

in the Response dated March 29, 2004 in Serial No. 10/049,675

ABSTRACT

An electric field sensor employs a capacitive pick-up electrode in a voltage divider network connected to a body emanating an electric field. The system is relatively insensitive to variations in the separation gap between electrode and body, reducing sensor motion artifacts in the output signal and stabilizing its low frequency response. The pick-up electrode may be positioned at a "stand off" location, spaced from intimate contact with the surface of the body. This is equivalent to providing low level capacitive values for the capacitive coupling between the pick-up electrode and the body whose electric field is to be monitored. Or a series limiting capacitor may be provided in the input stage. Human body-generated electrical signals may be acquired without use of conductive gels and suction-based electrodes, without direct electrical contact to the body, and even through thin layers of clothing.



Schedule B

Claims as the Remain after Amendments in the Response dated
March 29, 2004 in Serial No. 10/049,675

Claims 1-21 (Cancelled)

22. (Previously Presented) An electric potential sensor for detecting an electrical potential difference present over a source surface comprising:

- (1) a voltage divider network including at one end a pick-up electrode with a face surface having an insulating layer positioned adjacent to said face surface for placement next to a source surface whose electrical field is to be sensed through capacitive coupling
- (2) an electrical coupling at the other end of the voltage divider network for connection to another portion of the source surface over which an electrical potential difference exists; and
- (3) voltage sensing means for providing a voltage output, said voltage sensing means having an input capacitance that forms a portion of the voltage divider network, the voltage sensing means being connected for measuring the voltage appearing across that portion of the voltage divider network provided by said input capacitance and for providing a voltage output that corresponds to the strength of said electrical potential difference

characterized in that the capacitance that can exist between the source surface and the voltage sensing means is sufficient so that, when the pickup electrode is placed adjacent the source surface, the change in the capacitive coupling between the voltage sensing means and the source surface arising from a change in the separation distance between the pickup electrode and said surface varies insensitively with displacement of the electrode towards or away from the surface whereby, upon variation of the separation

Schedule B

Claims as the Remain after Amendments in the Response dated
February 9, 2004 in Serial No. 10/049,675

distance between the source surface and the pick-up electrode, the overall, effective capacitance formed in use between said source surface and the voltage sensing means through the pick-up electrode is such that the change in capacitance is less than 50 percent when subjected to a 0.1 mm increase in said separation distance, and wherein the voltage sensing means has an input resistance that, when combined with the capacitance that can exist between the source surface and the voltage sensing means through the pick-up electrode, provides an RC filter with a low-frequency cut-off of at least 0.05 hertz.

23. (Currently Amended) A sensor as in claim ~~11~~ 22 wherein the voltage output of the voltage sensing means is an unmodulated voltage output that corresponds to the strength of said electrical potential difference.

24. (Currently Amended) A sensor as in claim ~~11~~ 22 wherein the percentage change in capacitance is less than 20% when a 0.1 mm increase in the separation distance occurs.

25. (Original) A sensor as in claim ~~11~~ 22 wherein said insulating layer is of such dimensions as to preclude the electrode from providing a capacitance value of over 40 picoFarads/cm².

26. (Original) A sensor as in claim ~~11~~ 22 wherein said insulating layer is of such dimensions as to preclude the electrode from providing a capacitance value of over 20 picoFarads/cm².

Schedule B

Claims as the Remain after Amendments in the Response dated
February 9, 2004 in Serial No. 10/049,675

27. (Currently Amended) A sensor as in claim ~~11~~ 22 wherein said insulating layer is of such dimensions as to preclude the electrode from providing a capacitance value of over 10 picoFarads/cm².

28. (Currently Amended) A sensor as in claim ~~11~~ 22 comprising a series capacitor, positioned within said voltage divider network between said pickup electrode and the voltage sensing means, said series capacitor having a value in picoFarads of less than five times the area of the pick-up electrode in cm².

29. (Currently Amended) A sensor as in claim ~~7~~ 28 wherein said series capacitor has a value of between 5 and 40 picoFarads.

30. (Currently Amended) A sensor as in claim ~~11~~ 22 comprising a leakage resistor in parallel with the input capacitance of the voltage sensing means of between 10¹¹ and 10¹³ ohms.

31. (Currently Amended) A sensor as in claim ~~11~~ 22 comprising a capacitive coupling for connection to the source surface at the end of the voltage divider network opposite the pick-up electrode.

32. (Currently Amended) A sensor as in claim ~~11~~ 22 comprising a resistive-contact coupling for connection to the source surface at the end of the voltage divider network opposite the pick-up electrode, said resistive contact coupling having a resistance value of 500 k ohms, or less.

33. (Cancelled)

Schedule B

Claims as the Remain after Amendments in the Response dated
February 9, 2004 in Serial No. 10/049,675

34. (Currently Amended) A sensor assembly system comprising a first sensor as in Claim ~~11~~ 22 and a second sensor as in claim 1 applied at a spaced separation over the source surface, said first and second sensors being connected to a differential amplifier to obtain the difference in the output signals from two locations on the surface with common mode noise rejection.

35. (Currently Amended) A sensor assembly comprising multiple sensors each as in Claim ~~11~~ 22 assembled on a carrier to locate the pick-up electrodes of each sensor in a fixed, preformatted array.

36. (Currently Amended) A sensor assembly as in Claim ~~14~~ 35 wherein the carrier is a piece of clothing that can be readily donned or removed with minimal inconvenience.

37. (Currently Amended) A sensor assembly as in Claim ~~14~~ 35 combined with tele-monitoring means.

38. (Previously Presented) A method of sensing an electrical potential difference present over a surface comprising:

- (1) presenting a pickup electrode to confront said surface and to establish a capacitive coupling to said surface and receive a signal based upon the electric field emanating therefrom;
- (2) applying the signal so received to a voltage divider network which includes at one end the pick-up electrode and at another end an electrical coupling means connected to another portion of the surface over which an

Schedule B

Claims as the Remain after Amendments in the Response dated
February 9, 2004 in Serial No. 10/049,675

electrical potential difference exists, there being a high impedance amplifier with an input capacitance connected in series within said voltage divider network, the high impedance amplifier having an input resistance that, when combined with the capacitance that can exist between said surface and the high impedance amplifier through the pick-up electrode, provides an RC filter with a low-frequency cut-off of at least 0.05 hertz;;

- (3) maintaining the pickup electrode at a spaced separation from the confronted, field-emanating surface so that the overall effective capacitance between said surface and said amplifier has a value in the region of a plot of capacitance value versus separation distance wherein the percentage change in capacitance is no greater than 50 percent when subjected to a 0.1 mm increase in the separation distance occurring between the pick-up electrode and the confronted surface

whereby a signal is provided to the amplifier to provide an amplifier output voltage that corresponds to the strength of said electrical potential difference, and wherein the capacitive coupling between the field-emanating surface and the amplifier through the pickup electrode varies insensitively with displacement of the electrode away from said surface.

39. (Currently Amended) A method as in claim ~~17~~ 38 wherein the percentage change in the capacitance is less than 20% when a 0.1 mm increase in the separation distance occurs.

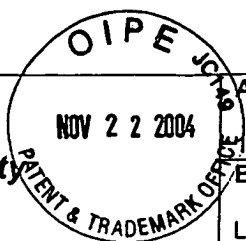
Schedule B

Claims as the Remain after Amendments in the Response dated
February 9, 2004 in Serial No. 10/049,675

40. (Currently Amended) A method as in claim ~~17~~ 38 wherein the pickup electrode has a surface confronting face that is provided with an insulative dielectric layer having a thickness such as to preclude the electrode from providing a capacitance value of over 40 picoFarads per centimeter squared.

41. (Currently Amended) A method as in claim ~~17~~ 38 wherein the voltage divider network includes a series limiting capacitor between the pickup electrode and the input to the amplifier, the pickup electrode having a value of between 5 and 40 picoFarads.

Notice of Allowability



Application No.

10/049,675

Examiner

Lee S. Cohen

Applicant(s)

BRUN DEL RE ET AL.

Art Unit

3739

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to applicant's communication filed 3/29/04.
2. ☒ The allowed claim(s) is/are 22-32 and 34-41.
3. ☒ The drawings filed on 30 September 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 2/9/04
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☒ Examiner's Amendment/Comment
8. ☐ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.


Lee S. Cohen
Primary Examiner
Art Unit: 3739